Vertical Asymptote WS: Hints (not complete solutions)

1) $\dfrac{x^2-x-6}{x^2-4}$

$\dfrac{(x-3)(x+2)}{(x+2)(x-2)}$

2) $\dfrac{x^2-10x+21}{x^2-x-12}$

$\dfrac{(x-7)(x-3)}{(x-4)(x+3)}$

3) $\dfrac{(x^3+x^2)(-16x-16)}{x^2-16}$

$\dfrac{x^2(x+1)-16(x+1)}{(x+4)(x-4)}$

$\dfrac{(x^2-16)(x+1)}{(x+4)(x-4)}$

$\dfrac{(x+4)(x-4)(x+1)}{(x+4)(x-4)}$

4) $\dfrac{x^3-5x^2+4x}{x^3-8x^2}$

$\dfrac{x(x^2-5x+4)}{x^2(x-8)}$

discont @ $x=0$ & $x=8$

not able to remove div by 0

infinite dis. @ $x=0$, $x=8$

5) $\dfrac{x(x^2-5x-4)}{x(x^2-8)}$

rem. / infinite

discontinuity @ $x=0$ & $x=\pm\sqrt{8}$

6) $\dfrac{(x+4)(x+2)}{(x-4)(x-2)}$

7) $\dfrac{(x+7)(x-4)}{(x-4)^2}$

can't remov. div by 0 @ $x=4$

infinit dis @ $x=4$

8) $\dfrac{3(x-2)\sqrt{x^2+1}}{5(x-2)}$

rem. @ $x=2$

9) $\frac{(x-5)(x+2)}{\sqrt{x+2}} = \frac{(x-5)(x+2)}{(x+2)^{1/2}} = (x-5)(x+2)^{1/2}$

$\sqrt{x+2} = 0$ able to rem div by 0

$x+2 = 0$ $\therefore$ rem. dis. @ $x = -2$

$x = -2$ domain $(-2, \infty)$

10) $f(x) = \frac{4+x^2}{\sqrt{4-x^2}}$

$x = \pm 2$ dis.

infinite disc.

$\lim_{x \to 2^+} f(x)$ D.N.E

$\lim_{x \to -2^-} f(x)$ D.N.E

b/c domain is $(-2, 2)$